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## A PLEA FOR STEAMMANSHIP IN THE NAVY.

BY REAR-ADMIRAL S. EARDLEY-WILMOT, R. N.

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IN the January number of this REVIEW, Admiral Luce puts forward a plea for an Engineer Corps in the Navy—that is to say, a body of officers distinct from those who rise to command ships and fleets. I believe that such a policy would be a retrograde step.

I admit there is something at first sight apparently attractive in the argument which urges the impossibility of making an officer a jack-of-all-trades and hence master of none. There must be specialists in the higher branches of naval science; but, when a person speaks of knowledge of marine machinery and the direction of ships or fleets as pertaining to two distinct professions, I at once join issue with him. That they were considered so in the past led to all the difficulties which we are endeavoring to remove. To realize this, it is necessary to recount briefly how this came about, at any rate as regards the British Navy.

At the outset, let me disclaim that definition of a seaman which limits him to a knowledge of handling and navigating a ship under sail. What has always differentiated the landsman from the seaman is that the one can move, or cause to be moved, a craft on the water, and the other cannot, whether that craft be a coracle, canoe, rowboat or sailing-vessel. The seaman could handle or put in motion, in each case, the power which propelled the craft. The landsman was equally at fault whether with paddle, oar or sail. When steam-power replaced sail-power as the propelling agency, why did it not follow the same law?—for we have seamen to-day who know little more of the machinery which moves their vessel than a landsman. We will trace the cause.

Before the Norman Conquest of the British Islands we had proficient seamen on the coast engaged in trade and the fisheries, but

not trained to arms. The best sailors were on the south coast, and their craft were organized as the fleets of the Cinque Ports. When a fighting-force was required at sea, the vessels underwent some modifications, and soldiers embarked with the weapons of that day. As soon as the time of combat arrived, the mariners placed the vessel where the men-at-arms could ply their weapons or board the foe. The custom of having separate forces for navigating and fighting at sea continued for many years after the introduction of cannon and large-masted ships. Then its great inconvenience became more apparent. If in action considerable casualties occurred to the men working the guns, they could not be reinforced from the mariners; while, if the sailors suffered heavily, the soldiers could not be used for manipulating the sails as required. The soldiers were landsmen. Hence one force proficient in both duties became necessary, and the working of the guns fell to the sailors, a certain number of soldiers being retained for musketry—a custom which still prevails in a modified form with the Royal Marines. We also used soldiers to complete crews of ships when sufficient seamen could not be obtained.

We find, then, practically one corps propelling the ship and working its weapons during the old wars which terminated in 1815. The naval officer took great pride in handling his ship under sail. He knew all about the art, having assimilated it in infancy. He had graduated in the various branches of equipment, maintenance and repair, so there was nothing about the propelling power of his ship he did not know. He could tell from personal knowledge if a sail required shifting, a yard repairing or a rope renewing. Familiarity with theory and practice went together to make him a master in the art of seamanship. Of course, some officers attained great superiority over others in these respects; but the general standard was high, because in this portion of a naval officer's calling specialization did not exist: the propelling power was common to all. A lieutenant could splice a rope, turn in a dead-eye, or handle palm and needle as well as the most skilful sailor or boatswain.

Such was the position of affairs when, about 1820, steam-power knocked at the door of our picturesque war-ships. It gained a tardy admittance, but pride and prejudice denied it the parlor and relegated it to the kitchen. Our officers as a body would have nothing to do with the newcomer. It tarnished the spot-

less decks, spoilt the trim for sailing, and was to those conservative old salts an unseamanlike method of propulsion. Though unable to prevent its advent, they could impede the development of steam, which made slow progress. First came the paddle-wheel, then the screw-propeller. A few men divined what the future held, and recognized the advantages of a power independent of the wind, as when Charles Napier had paddle-wheels fitted to his sailing-frigate and worked them by winches, but distinguished admirals shook their heads when Ericsson gave a demonstration on the Thames of a boat propelled by steam and a screw. They feared it would impair steering efficiency. However, there was no resisting the importunity of steam; and, when it definitely arrived, the Navy entered a corps of engineers and stokers specially for this duty. At the time no alternative existed, for we had not thought of grafting a steam course on to the training of seamen so as to fit them for handling the new power. Nor could such foresight, perhaps, have been expected; for, between 1820 and 1860, the number of engineers and stokers in the complement of a war-ship was comparatively small. Machinery did no more than propel the ship; we had no steam-boats, and even the anchor came up by manual labor.

Though we thus infringed the principle of having only one class for propelling and fighting—for the newcomers were not taught gunnery or navigation—in the limitation of the numbers and the duties of the special corps, we escaped the difficulties which later on beset us. We must remember that even the ablest officers viewed steam only as an auxiliary to sail. As an indication of the estimate in which the Navy held steam it may be mentioned that engineer officers when first entered held only warrant rank. Steam war-ships of all classes carried a full equipment of masts and sails, and resorted to steam only when it was absolutely necessary to do so. During a three years' commission in the Pacific on board one of our early ironclads, we traversed 51,000 miles of water, out of which 34,000 miles were accomplished under sail. Looking back, one is lost in admiration—though the feeling is mingled with regret for misdirected effort—at the enthusiasm and perseverance with which officers pursued the impossible task of making a craft almost devoid of sailing capacity emulate the "*Saucy Arethusa*" of bygone days.

This worship of a cult no longer of primary importance to

the fighting-ship diverted attention for a time from a pressing need. We may even admit some justice in the contention that a seaman of the period when sail and steam struggled for mastery could hardly become an expert in both, and hence that there might have been then a necessity for two classes; but when clear proof arrived that the retention of sail-power served no good purpose, besides crippling the fighting capacity of modern war-ships, we should at once have taken steps to modify naval training with another end in view. Instead of which we continued to instruct seamen fully in all the paraphernalia of a dying art, and at the same time to increase the numbers of those specially trained in machinery but not trained to weapons or in navigation. For now the new power began to absorb every operation in ordinary routine afloat. Steam brought the anchor to the bows, hoisted in boats, steered the ship, trained the guns, but in all of this the so-called seaman played almost the part of a spectator only. Naturally, the corps which possessed the knowledge of these things increased in importance as well as in numbers, and gradually acquired a power which led to extensive modifications in its status.

The fact of having a separate body of officers for this all-important duty, combined with traditional prejudice, kept the general mass of combatant officers from acquiring any intimate knowledge of steam-machinery. Proficiency in this branch did not influence advancement or employment; ignorance did not retard promotion. Forty years ago, young officers qualifying for the rank of lieutenant were examined in Seamanship, Gunnery and Navigation; the Seamanship questions comprising all the art of the ancient mariner. I remember my own experience, and the delight of my examiners at being told correctly how to clubhaul off a lee shore under sail; but it never entered their heads to question me as to the type of engines fitted in my ship. Later, Torpedo and Pilotage were added to the subjects for this examination; but earlier promotion, which rewards exceptional attainment in all these, is independent of intimate acquaintance with the power which propels the ship. Can we wonder, then, at the view held by many—erroneous, as I think it—that to become an expert in steam requires the sole attention of a lifetime; that an officer unaccustomed to the subject and looking into a modern engine-room should see there too vast a subject to be

added to his existing burden of professional knowledge? But is not this a matter of age and early training? I remember, as a midshipman in a full-rigged ship, landsmen looking aloft at the innumerable ropes leading in every direction, and exclaiming: "Do you mean to say you know the names of all the ropes and what they do? I should think it would take a lifetime to learn that!" Why did it appear a simple matter to the youngster of that day? Because he had been associated with ropes and the then seaman's stock in trade almost from infancy. Assimilation in early life is the answer to those who see such mystery in the engine-room. The first twenty years of my naval career were spent in full-rigged steamships, and this experience led me to form the opinion that it was more difficult to acquire proficiency in sail propulsion than in steam propulsion, and that more science was involved in the former. The perfect seaman of old required such a knowledge of weather as could only come from years of experience, and a constant study of atmospheric conditions enabled him to conquer the elements when most adverse. The power conferred by steam gives an independence of movement which obviates the need of such close study of wind and sky.

I believe most officers whose service includes this transition period will agree with the foregoing; but, under any circumstances, I maintain that a thorough knowledge of ship propulsion must be attained by all officers as the first attribute of a seaman to-day. For the position of affairs when we instituted the new course of naval training was as follows: We had a large body of officers versed in all the mechanical appliances which gave the vessel life as well as movement, but not trained to gunnery or command; while another body directed the vessel, without any considerable acquaintance with the motive power. The rivalry between these two corps formed the least evil of this dual system. Want of interchangeability might have serious results in an action. Assume the engine-room to be immune, by its position, from serious injury by shot or shell, but suppose it has suffered heavy casualties from some accident below; if all have been trained in propulsion, it can be reinforced from the deck in such a case without difficulty. Take the converse. Working guns with diminished crews has always formed part of ordnance drill. Gun-fire is slackening owing to the well-directed projectiles of the enemy. The guns want reinforcing, and the engine-room

can spare one or two officers with a party of men for that purpose. What a source of strength if, in either case, each set of persons can at once drop into familiar duties; for I advocate that men as well as officers be trained on the same lines. But the main point is that the man in command, in order to handle his craft to the best advantage in peace or war, must have a complete grasp of all the machinery which converts her from an inert mass into an organism replete with life. This is only achieved by early and constant familiarity. I think most officers in command have felt, at some time or another, their need for more knowledge in this respect. It was often so in my own case, involving something approaching to a feeling of humiliation that a subordinate possessed knowledge that I lacked; a condition that did not apply as to guns, torpedoes, etc. Such will always be the case when there is a separate and distinct class for the performance of any particular duty; the tendency will be to lower the standard of knowledge regarding that duty among the mass of individuals.

A striking example of this is furnished by the system—formerly prevailing in the British Navy—of having a separate and distinct corps of officers for navigation who did not rise to command ships of war. Although navigating a vessel is one of the primary attributes of a seaman's calling, it was made the specialty of a class, with the result of diminishing the interest felt by other grades in this work. To the proposal to abolish the system many opposed urgent objections somewhat similar to what we hear now about the machinery. Our ships would be badly navigated; we must expect an increase of grounding; it required a man to devote his whole life to this branch, and so on. Nevertheless, the change was made; and I have heard two successive hydrographers affirm that the navigation of our fleet is as good as, if not better than, it was under the old régime, while the general knowledge of this subject among all officers has much improved.

I do not agree with Admiral Luce in his advocacy of specialization if carried to the extent of separation into classes. A certain number of specialists are necessary for the higher branches of naval science; but natural bent and other influences will meet the demand without creating distinct classification at the outset. A high general standard is most essential, and it is best attained by keeping specialization within the narrowest limits.

I must confess that the views here set forth do not command universal consent with my brother officers, especially among the most senior. In discussing the question with them, they frequently cite the United States Navy as an instance where the attempt to make deck officers interchangeable with the engine-room staff has—they say—failed. I am not aware whether this is the case or not; but, if any want of success has resulted, I should attribute it to the fact that the change has not been sufficiently gradual in its operation. I remember reading the memorandum of the Assistant Secretary which introduced or preceded the Personnel Act, and it seemed to me that the reasons given for the policy advocated were absolutely unassailable. The method of application may have impaired success. For such a great change as the amalgamation of two classes whose duties had hitherto been distinct, gradual preparation is necessary. To direct an instant alternation of duties would not suffice where one set of duties was viewed with disfavor by many affected. A prejudice fostered by tradition existed against engineering duties in the Navy, so that, while those hitherto employed below went willingly on deck, there was not the same alacrity on the part of the deck officers to take their turn in the engine-room. At least so I gathered from a report of the Engineer-in-Chief of the United States Navy, accompanying Estimates of the Bureau of Engineering for the fiscal year ending 1903.

Though following the lead thus given by the United States, the British Admiralty are applying the principle by more gradual steps. The naval officer, at the earliest moment of his career, has impressed on him the importance of engineering work, and at once begins his training in it. No prejudice against this branch has entered his mind. In most cases, a desire to handle tools and machines exists at the age—12 to 13—when he thus begins to master the elements of mechanical appliances. A well-found workshop gives him that early familiarity with machines which his predecessor had with masts and sails. Hardly emerged from childhood, he thus begins to assimilate modern seamanship; and, in a year or two, cylinders, pistons, turbines, etc., will present no more difficulty as a form of knowledge than the paraphernalia of sails and ropes did to the "Skilful Urchin" of old.

Other critics, though recognizing the benefits that will accrue from giving the executive officer a more extensive knowledge of



steam, are afraid he will lose the faculty of command, while we shall only obtain amateur engineers. In neither case do I share this gloomy view. An equal distribution of time on deck and at the machinery for the young officer at sea will give him ample opportunity for practical acquaintance with both duties. A midshipman's work on the quarterdeck of a modern war-ship does not involve many or varied services. There seems no reason why a daily turn of duty in the engine-room should incapacitate a lieutenant from efficient control on the bridge.

Why, again, should we not obtain good engineers under a system which gives them several years' continuous instruction in this branch at the most receptive age? We cannot expect that all will achieve preeminence; but, as with gunnery, torpedo surveying, etc., we shall secure a sufficient number with a special aptitude for the work to execute the higher functions appertaining to marine engineering.

It is said, and Admiral Luce dwells on the point, that the Mercantile Marine have not adopted, and will not adopt, any such system. That is quite possible, as the two services have a different end in view. The Navy exists mainly for use in war. Its organization is based on that eventuality, and the crews of vessels composing the fleet must be trained to that end. I have indicated how fighting capacity is augmented by departing from the dual and specialized distribution of the crew. This consideration does not apply to the Mercantile Marine, which may therefore prefer to retain things as they are. A few years ago we were told that it would not adopt water-tube boilers or turbine engines, as the advantages in each case were supposed to be discernible only from a fighting point of view; but, apparently, the commercial prejudice against this machinery is disappearing. In the same way I cannot help believing that the Mercantile Marine will eventually adopt the naval system of training for the advantages it possesses apart from the question of combat.

A further objection advanced is that the naval officer, once he takes up engineering as a special line, must remain there and lose his chance to command a fleet. This does not follow, and is not experienced by gunnery, torpedo and navigating officers. A lieutenant allocated to engineering duties—that is, to the charge of machinery, in the sense in which ordnance and gunnery practice is under the supervision of the gunnery officer—

will receive promotion in due course, and may or may not continue in the same path. There will be good scope if inclination and aptitude retain him for the higher branches of marine engineering.

Finally, the British Navy has the best chance of success for the policy it has adopted because of the early age at which it enlists its executive officers. As long as I can remember, the age for entry and the training to follow have not only formed subjects for argument afloat and ashore, but have also engaged the attention of many committees appointed to report on the subject. The conclusions of these differed in nearly every instance, as they viewed the requirements for a naval officer from different standpoints. One wanted greater scholastic attainments, another more practical experience. Through good repute and bad repute, our naval authorities have maintained the principle of early entry for a sea life, with, I believe, on the whole, good results. We may be, and probably are, inferior in scholastic knowledge to those officers whose school teaching is continued to a later age. Our acquaintance with foreign languages is not equal to that of the German naval officer, for instance. But, after all, the primary object in the training of a naval officer is that he may handle his ship efficiently under all circumstances in peace, and prevail in war. We are content, therefore, to sacrifice some of the graces to secure that early practical acquaintance with sea conditions and responsibility to which we attach greater importance. As the Admiralty Memorandum introducing our new system eloquently puts it:

“Notwithstanding the fact that, during the transition period, the system of naval education has been the subject of much criticism, the character of the naval officer has remained unimpaired, and character is of more value than knowledge. Now, however, as always, the highest type of naval officer is that wherein great professional knowledge is added to force of character.”

It was because great professional knowledge of perhaps the most important portion of a sea career was not attained under the old system; because that system, from lack of the unity which can only be secured by a common entry and method of training, led to conflicting interests detrimental to the service; and because of the weakness attached to maintaining two forces not readily inter-

changeable when occasion demanded, that we introduced the great change now in operation. Of its success, if loyally accepted, and not impeded by prejudice, foreboding and lukewarm adherence, I have no doubt. I will go further and predict that, given the support we have a right to expect for a step taken to remove an undesirable state of affairs, we shall in ten years' time only wonder that it had not been taken at an earlier period.

Since writing the foregoing, I have read the article, "Our Navy," by "An American Citizen," in the March issue of this REVIEW, supporting the views of Admiral Luce. As we are told that he is, from close observation, familiar with the conditions which prevail in the naval service of the United States, I desire to add a few comments upon that portion of his article which deals with the specialization of functions on board ships of war.

In the first place, I do not contest the right of any layman to express an opinion upon a subject which requires for its mastery, not only familiarity with the conditions of naval service, but also practical experience of the service itself. Continued observation and discussion with those qualified by experience to instruct will allow of an opinion being formed which may or may not be sound; and the opinion expressed in this case appears to me unsound. Three functions are mentioned as necessary to the efficiency of a war-ship, and these are stated to be separated by broad lines of demarcation. These are the sailor to command, the engineer to propel and the gunner for the weapons. Certain attributes are considered essential for the man in command. Though he must know all about manœuvring ships and bringing them into action, he need not be master of the details of that machinery which enables his ship to come into action.

I have already endeavored to show why such knowledge is necessary, but the reasoning by which the opposite view is here sustained needs refutation. It is based on the fact that the propelling power is now out of sight, whereas formerly the sails were always in view of the officer on deck. Hence, the commander to-day need only know the effect and not the cause of the power he wields. Surely such a view is erroneous and loses sight of much that is requisite to qualify a man to command a modern battle-ship. The skilful sailor of old did not require to have the sails in sight to know whether they were exercising a correct effect. A thorough seaman could tell from his bed if his ship

was not being sailed properly, and give the remedy to an inexperienced officer of the watch. I have been with captains who never came on deck at night, but who, nevertheless, knew at once if sails were not properly trimmed. What made men pre-eminent as seamen of old was not so much their conduct on the day of action, as the way in which they maintained their ships in readiness for this event and repaired them afterwards. It came from their close knowledge of the propelling power; not only how to work it to the best advantage, but how to preserve it from injury. We require the same intimacy with steam-power to produce a like result.

In support of the view that the supreme head of this fighting instrument does not require to know any details of his machinery, we are invited to contest or criticise a claim that one day's study of steam-power and modern gunnery would qualify a Drake, a Nelson or a Farragut to fight a naval battle with existing vessels. Into such a contest I am not disposed to enter, for it would entail absorbing nearly the entire space of this number, and my contribution is already long enough. I will only add a few remarks on the ordnance question. How "modern progress has reduced this department of marine warfare to a science quite distinct from that of managing or propelling the ship," I am at a loss to imagine. It would appear to me that the agencies which, in one case, propel a projectile and, in the other case, a piston or turbine are not entirely dissimilar. It would be a strange vessel in which the crew were split up into sections entirely ignorant of each other's business, for An American Citizen approves, I gather, even of encouraging officers to specialize in ordnance. He would have a distinct corps for this branch, as it "involves a separate application of science, which can best be pursued by men devoted to it." Having been a Gunnery as well as a Torpedo officer, I may be classed, presumably, as a specialist; but, so far from agreeing to augment specialization to the extent of a separate department, my feeling is to contract specialization and insist upon all officers being familiar with the forces and weapons they employ. By following that principle alone can we assure a good standard of professional knowledge in all, which will be of more value in the varied requirements of war than the highly specialized knowledge of a few whose safety until the end of the action we cannot insure.

E. EARDLEY-WILMOT.